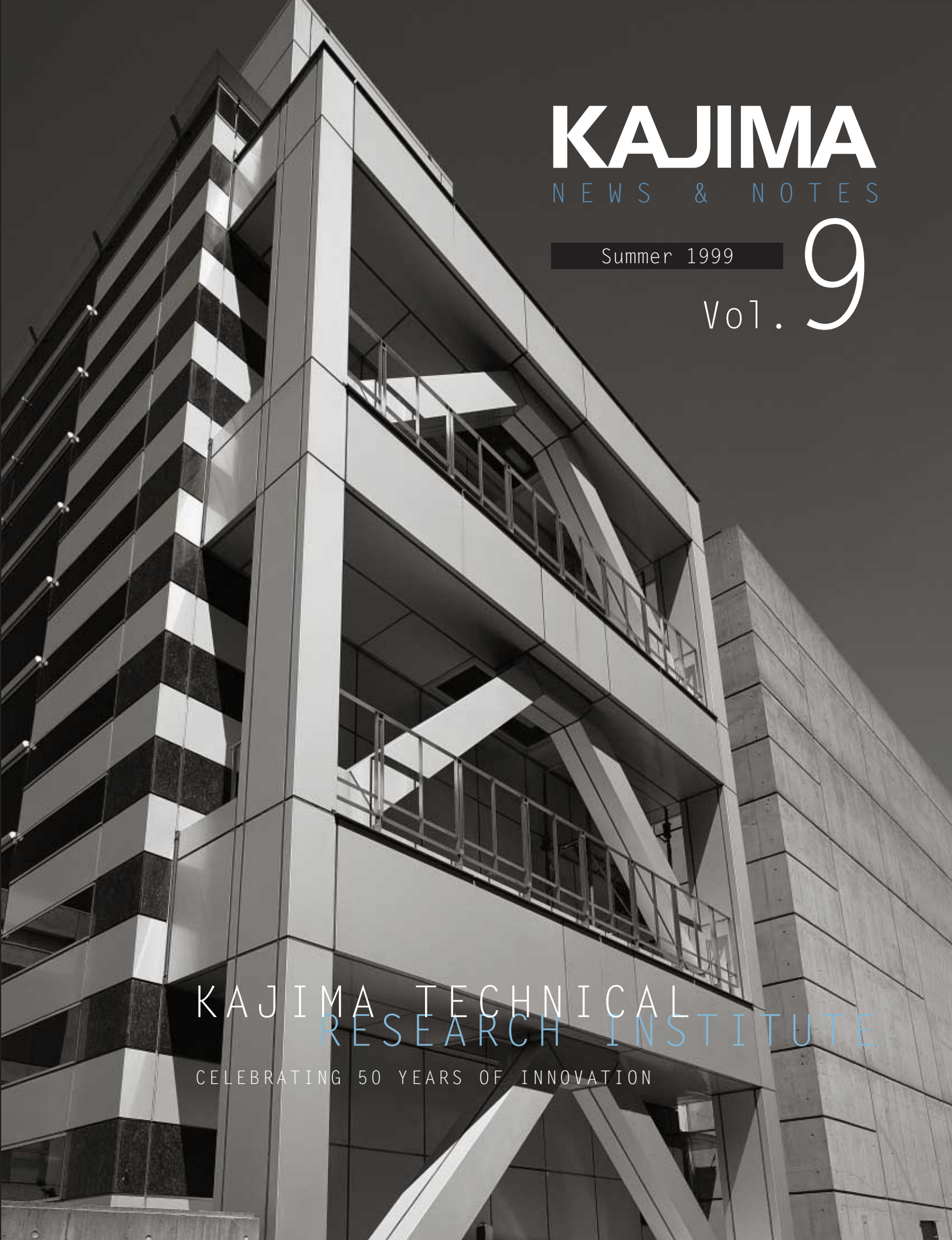

KAJIMA

NEWS & NOTES

Summer 1999

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KAJIMA TECHNICAL RESEARCH INSTITUTE

CELEBRATING 50 YEARS OF INNOVATION

Celebrating 50 Years of Innovation

In 1999, Kajima Technical Research Institute, based in Chofu in Tokyo, celebrates its 50th anniversary. The institute was established in April 1949, based on the philosophy of then Company president, Morinosuke Kajima, that "constant research and creativity will lead to the progress and prosperity of society."

Kajima was the first company in the Japanese construction industry to establish a technical research institute. In the half century since its inception, the institute has constantly played a central role in supporting what might be termed "Kajima Technology," the Company's celebrated technological excellence.

The institute's activities are divided mainly into R&D, technical support, training, and dissemination of the results of R&D. One of the institute's most important functions is to carry out various tests to verify that structural designs are sound and construction materials function properly as well as to check that they are reliable, safe, and result in structures that provide a pleasant and comfortable environment.

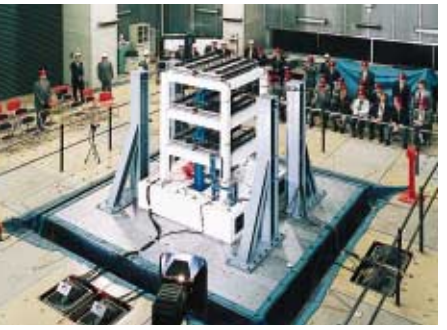
The Kajima Technical Research Institute continues to tackle the diverse

range of technical challenges that the construction industry now faces in such areas as materials, construction, production, and structural techniques. The institute is developing far-ranging technologies, including earthquake-resistant building techniques, while studying how buildings and structures affect our living conditions and surrounding environment, and how to minimize damage due to natural disasters.

Also, the institute carries out R&D in a wide range of civil engineering fields, including materials, inspection, testing, measurement, and analysis through to design and construction technology. In recent years, the institute has extended its efforts into demolition and the repair and strengthening of existing buildings and civil engineering structures. Through this work, the institute provides technical

History of Kajima Technical Research Institute

1949	Kajima establishes the Japanese construction industry's first research institute in Chuo-ku, Tokyo
1956	The institute moves to its current location (Tobitakyu, Chofu, Tokyo)
1959	The industry's first radioisotope laboratory and acoustic laboratory are completed
1963	Large-structure testing laboratory is constructed, and computer systems are introduced
1966	Computer center is established
1968	Materials research and testing laboratory is completed
1972	Wind tunnel testing facilities are constructed
1974	Another large-structure testing laboratory is constructed, and large shaking table is installed
1975	Ocean and hydraulic laboratory and soil mechanics and foundations laboratory are completed
1981	Hayama Marine Science Laboratory opens
1984	Nishichofu complex with large-structure testing laboratory is completed
1986	Environmental engineering laboratory is completed
1988	Building construction and fire safety laboratory are completed
1990	Shaking table laboratory and soil mechanics and foundations laboratory are completed
1991	Biological and plant science laboratory expanded
1994	Concrete and wind tunnel laboratory completed
1996	Plant technology laboratory completed
1999	Structural reorganization of the institute implemented



A test, open to the public, of the shaking table being demonstrated as part of an exhibition at the Kajima Technical Research Institute.

Capable of accurately simulating earthquake conditions, the table is one of the largest owned by a private company in Japan.

support and cooperation to civil engineering projects at both the planning stage and on-site.

In February 1999, as part of its commitment to operating a highly competitive R&D unit, Kajima restructured the institute. Research capabilities relating to civil engineering and construction—the Company's principal business areas—were consolidated into two new departments, the Civil Engineering Department and the Building Engineering Department. These departments will continue to pursue existing research projects while aiming to integrate R&D from numerous research areas and apply technology to developing new products.

To strengthen its position in the newly emerging environmental protection-related market, the Company has consolidated its environment-related R&D capabilities into one new department, the Environmental Engineering Department. The Company has also consolidated its advanced technology R&D capabilities relating to civil engineering, construction, and environmental protection, into one new department, the Advanced Technology Department.

The Advanced Technology Department perfects the basic research that is indispensable to Kajima's success and is engaged in forward-looking research that will have an impact on the next generation of the Company's operations. Futuristic research fields include those related to earthquakes, the effects of strong winds on buildings and structures, vibration response control, mechatronics, and risk assessment.

Kajima is proud of its position as the private-sector leader in the field of earthquake engineering. Since our completion in 1968 of the Kasumigaseki Building—Japan's first high-rise building—we have continued to pursue cutting-edge research in this field.

The institute is focusing on earthquake-resistant building techniques by, for example, testing the strength of structures over time to evaluate vibration characteristics. The institute also conducts research into seismic response control technology and methods of improving the resistance of existing structures to earthquakes by, for example, strengthening reinforced concrete bridge piers and the fiber sheets used in reinforced concrete pillars. Other areas of research include earthquake-resistant floor systems, methods of increasing earthquake-resistance that combine layered rubber with mobile supports, large-scale earthquake resistance systems that employ floating foundations, and devices that use magnets to control the vibration of cables used on suspension bridges.

Through the success of its R&D in such areas as earthquakes, the Kajima Technical Research Institute has provided technological support and cooperation in a wide range of areas, helping to make people's daily lives more comfortable and fulfilling while serving the development of society.

Kajima around the World

From Vietnam

Completion of Me Linh Point in Vietnam

Kajima Overseas Asia Pte. Ltd. (KOA) has just completed the 25-month-long construction of the Me Linh Point, a 22-story office building with a four-level retail center and a two-level basement with a floor area of approximately 31,000 square meters, in Ho Chi Minh City, Vietnam. This eye-catching building was designed by D-Exodus Architects & Planners Pte. and is located in the center of the city where the scenery still mirrors the image of French colonial times.

KOA was awarded this project in 1997 as a result of international bidding by Me Linh Point Ltd., a joint venture of Center Point Properties—which belongs to the beverage manufacturing giant F&N Group, of Singapore—and a local company in Vietnam.

The excavation depth for this project (about 12 meters) was the deepest for any project in Ho Chi Minh City and was successful despite the weak ground and high water table due to the proximity of the Saigon River. It is common in Vietnam that construction projects are completed behind schedule due to such problems as obtaining permission from local authorities and customs clearance. However, KOA has completed this project on time and was acknowledged for its high quality and performance by the owner and the owner's consultants.

From Thailand

MRTA Groundbreaking Ceremony

Led by Kajima, the Metropolitan Rapid Transport Authority (MRTA) and Siam Nippon Metro Consortium JV (SNMC) signed a contract for the design and construction of a depot (contract

No.3) on December 9, 1998. The date for the commencement of work was December 28, 1998, and the expected completion date is January 27, 2002.

On May 13, 1999, MRTA and SNMC celebrated the groundbreaking ceremony for the project in the presence of Air Chief Marshall Samboon Rahong, a minister attached to the Prime Minister's office.

The main MRTA site is located at Huay Khwang with a total area of 1,600,000 square meters. Approximately 432,000 square meters is allocated for the MRTA Initial System Project (ISP) depot and 72,000 square meters is allocated for the temporary work.

The ISP depot will provide facilities for all ISP railway operations conducted off the main railway, including operations control, management, administration, and maintenance. The depot will provide sufficient space to accommodate an initial fleet of approximately 100 cars and allow for future expansion to accommodate a possible maximum of 500 cars. The depot structure will consist of an elevated concrete platform and canal bridges to support ballasted trackwork.

From Tanzania

Southern Tanzania Bridge Completion Ceremony

On May 10, 1999, a ceremony was held to mark the completion of the southern Tanzania bridge project. Tanzanian President Benjamin William Mkapa and senior Tanzanian government members attended the ceremony along with Japanese Ambassador Keitaro Sato and, from Kajima, advisor to the board Akira Miyazaki and other Kajima personnel involved in the project, together with many local residents.

The project, carried out by Kajima and funded by a Japanese government grant, involved the construction of one 120-meter precast concrete bridge and three 30-meter precast concrete bridges together with more than 1,290 meters of access road.

Construction work began in April 1997 and—despite disruption caused by the worst flooding in the area for many decades—the bridges were completed on schedule, due to the great efforts of all those involved with the project. It is expected that the bridges will contribute to economic growth in southern Tanzania, an area which has lagged behind the rest of the country in development.

From Egypt

Two Luxurious Resort Hotels in Egypt

Kajima has completed construction of two resort hotels in the suburbs of Hurghada, a Red Sea town that provides a distant view of the Arabian Peninsula. Hurghada is situated 400 kilometers south-southeast of Egypt's capital city, Cairo.

The hotels, the Robinson and the Sheraton, are both luxurious five-star accommodations with 300 rooms. Since the hotels are adjacent, an order was placed with Kajima for a joint construction project. The hotels are large-scale with a total floor space of 78,240 square meters.

As the construction site had no water and electricity supplies and no telephone connection, Kajima had to transport water purifiers and electricity generators—along with machinery, parts, and all raw materials other than aggregate—from long distances. Although such problems made this an extremely difficult project, the hotels were completed successfully thanks to the efforts of Kajima personnel and local employees.

From Japan

New Equipment That Generates Electrical Power from Raw Garbage without Incineration

Kajima has developed a new technology that generates electricity from raw garbage without incineration. The process uses methane produced by fermenting raw garbage to generate electrical power from a fuel cell. If raw garbage is incinerated without proper equipment, poisonous dioxins may be emitted. Kajima's new process, however, emits no poisonous substances. The Company aims to have a raw-garbage-powered electrical generator available by next year, which it hopes to market to hotels, food processing plants, and other commercial operators.

The raw-garbage-powered electrical generator combines a fermentor and a fuel cell. Raw garbage is shredded, liquidized, and fed into the hermetically sealed fermentor. Inside the fermentor, a special microorganism decomposes the organic slurry to produce methane. A catalyst is used to convert the methane to hydrogen, which is then passed into the electric cell where it generates electrical power.

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